IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Tomohiro MAEKAWA

Serial No. : 09/161,283 Group Art Unit: 1773
Filed: September 28, 1998 Examiner: KRUER, KEVIN R
For: LAMINATED EXTRUDED RESIN SHEET

DECLARATION OF TOMOHIRO MAEKAWA UNDER 37C.F.R.1.132

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

I, Tomohiro MAEKAWA, residing at 2-3-733, Ikku-cho, Niihama-shi, Ehime, Japan, hereby declare and say as follows:

1) I am the inventor of the above-identified application;

2) I graduated from Osaka Prefectual College of Technology (Department of Applied Chemistry) in March, 1991;

3) Since April 1991 to the present, I have been employed by Sumitomo Chemical Co., Ltd., assignee of the above-identified application, and engaged in research and development in the field of polymer chemistry;

4) I have read and understand the Office Action issued on April 22, 2002 and Advisory Action issued on August 21, 2002 in the above-identified application, and the prior art references cited therein; and

5) I carried out experiments to measure impact resistance of resin sheets, which contain resin particles with a

particle size of 12 μm (in Example A), 20 μm (in Example B), 35 μm (in Example C) or 50 μm (in Comparative Example A), respectively. A report of the results of the experiments is set forth below.

Experiments

Example A

A methyl methacrylate resin (100 parts by weight) (trade name: Sumipex EXA, manufactured by Sumitomo Chemical Co., Ltd.) was mixed by a Henschel mixer and was melt and kneaded by the same extruder ① as used in Example 1 of the specification of the above-identified application, to obtain resin A which was then fed into a feed block.

A methyl methacrylate resin (100 parts by weight) (trade name: Sumipex EXA) and cross-linked methyl methacrylate resin particles having a weight-average particle size of 12 μm (8 parts by weight) (trade name: Techpolymer MBX12, manufactured by Sekisui Plastics Co., Ltd.) were mixed with each other by a Henschel mixer and was melt and kneaded by the same extruder ② as used in Example 1 of the specification of the above-identified application, to obtain resin B which was then fed into a feed block.

Multilayer-extrusion molding of three-layer constitution of 0.1 mm/1.8 mm/0.1 mm was conducted at an extrusion resin temperature of 265℃ using the above-obtained resin A for resin layer (A) as an intermediate layer and using the above-obtained resin B for resin layers (B) as surface layers, to produce a laminated extruded resin sheet having a width of 21 cm.

Impact resistance of the obtained laminated extruded resin sheet was evaluated in a method shown in APPENDIX (attached hereto).

As a result, a damage height*[1] corresponding to the impact resistance of the sheet was 11.4 cm.

*[1] Larger damage height means higher impact resistance of sheet (see, APPENDIX).

Example B

A laminated extruded resin sheet was obtained in the same manner as in Example A except that cross-linked methyl methacrylate resin particles (trade name: Techpolymer MBX20, manufactured by Sekisui Plastics Co., Ltd.) having a weight-average particle size of 20 μm were used, instead of particles having a particle size of 12 μm.

Impact resistance of the obtained laminated extruded resin sheet was evaluated in a method shown in APPENDIX. As a result, a damage height corresponding to the impact resistance of the sheet was 11.1 cm.

Example C

A laminated extruded resin sheet was obtained in the same manner as in Example A except that cross-linked methyl methacrylate resin particles*[2] having a weight-average particle size of 35 μm were used, instead of particles having a particle size of 12 μm.

*[2] The particles having a weight-average particle size of 35 μm had been obtained in the same manner as in Reference Example 2 in the specification of the above-identified application except that particle-size classification with an air classifier had not been conducted.

Impact resistance of the obtained laminated extruded resin sheet was evaluated in a method shown in APPENDIX. As a result, a damage height corresponding to the impact resistance of the sheet was 10.9 cm.

Comparative Example A

A laminated extruded resin sheet was obtained in the same manner as in Example A except that cross-linked methyl methacrylate resin particles*[3] having a weight-average particle size of 50 μm were used, instead of particles having a particle size of 12 μm.

*[3] The particles having a weight-average particle size of 50 μm had been obtained in the same manner as in Reference Example 2 in the specification of the above-identified application except that particle-size classification with an air classifier had changed to obtain particles with the particle size of 50 μm.

Impact resistance of the obtained laminated extruded resin sheet was evaluated in a method shown in APPENDIX. As a result, a damage height corresponding to the impact resistance of the sheet was 9.6 cm.

I, the undersigned, declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so that made are

punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Tomohiro Maekawa

Tomohiro MAEKAWA

Dated this 8th day of October, 2002

APPENDIX

Impact resistance of a laminated extruded resin sheet was evaluated using a Dupont falling weight tester (model: Y.S.S. Tester, manufactured by Yasuda Seiki Seisakusho Corp.) as follows.

A sample sheet with 50 mm×50 mm×2 mm was prepared by cutting out of a laminated extruded resin sheet to be evaluated. The sample sheet was placed in an impact dice with 1/8 inch on a table with 3/16 inch. A weight (300g) was fallen down onto the sample sheet from the height of 5 cm. Based on length of the longest crack appeared on the surface of the sheet, damage level of the sheet was classified as follows:

Level	Length of crack
5	No crack
4	Shorter than 1 cm
3	1 cm or longer (Shorter than 2 cm)
2	2 cm or longer (Shorter than 3 cm)
1	3 cm or longer (Shorter than 4 cm)
0	4 cm or longer (or broken into pieces)

The same procedure was repeated 5 times, and the average level value of the damage levels in the 5-time measurements was calculated. Also, such 5-time measurements were conducted except that height from which the weight was dropped was changed to 10 cm, 15 cm or 20 cm, instead of 5cm, respectively.

The test results are plotted with the height from which the weight was dropped as abscissa against the average level value of damage level as ordinate, and then a standard-average line was drawn based on the plots. The height (cm) at which a damage level of the standard-average line is 3.5 is regarded as a damage height of the laminated extruded resin sheet. Larger damage height corresponds to larger impact resistance of the resin sheet.